

**A NEW SPECIES OF *AMPHILIUS* (PISCES, AMPHILIIDAE)  
FROM THE KONKOURE BASIN, GUINEA, WEST AFRICA.**

by

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**ABSTRACT :** *Amphilius kakrimensis* sp. n. is described from a small tributary of the Kakrima river, Guinea. The species differs from all other amphiliids in having a stout, deep body, a deep caudal peduncle and a strongly forked caudal fin.

**RÉSUMÉ.**— *Amphilius kakrimensis* sp. n. est décrit d'après des exemplaires provenant d'un petit affluent du Kakrima en Guinée. L'espèce se distingue des autres Amphiliidés par un corps robuste et épais, un pédoncule caudal élevé et une nageoire caudale fortement échancrée.

**Keywords :** Amphiliidae, *Amphilius kakrimensis*, new species, Guinea, Africa.

The upper Guinea Province, which includes the coastal drainages of Guinea and Liberia (Roberts, 1975), is one of the ichthyologically least known areas of West Africa.

The only substantial contribution to our knowledge of the fishes of part of this area, was produced by Daget (1962), who listed 97 species from Lower Guinea and from the Fouta Dialon, a mountainous massif in central Guinea. Fifteen of these were previously undescribed species. According to Daget (1962), the important number of new, remarkable and rare species might well indicate that several additional taxa still have to be discovered, especially as only part of the drainages was examined during his study.

This was recently confirmed by specimens from a new collection made by one of us (C.L.) during February 1986. Among the fishes collected are three new *Barbus* species, a new *Chrysichthys* species and a new *Amphilius* species. The latter is described herein.

**METHODS :** Measurements were made according to Skelton (1981, 1984 and 1986). Vertebral counts were taken from radiographs. All counts exclude 1-5 Weberian vertebrae and begin with the first normal rib-bearing vertebra. The first caudal vertebra was taken as that vertebra with a distinct haemal spine. Fin ray counts are based on the total number of discrete fin rays, i.e.

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each ray with a separate base. The divided last ray of the median fins is taken as a single ray if divided to a single base. Principle caudal fin rays include a single dorsal and a single ventral simple or unbranched ray and all branched rays between these simple rays. Osteological drawings were taken by camera lucida from a radiograph or a specimen cleared and stained for bone and cartilage according to the method of Taylor & Van Dyck (1985).

*Amphilius kakrimensis* sp.n.

HOLOTYPE : MNHN 1986-599 (Figure 1), 42.2 mm standard length, from a small tributary of the Kakrima river, Konkoure basin, at Kasserì (10°16'N-12°28'W), Guinea; Collector C. Lévêque; 14th February 1986.

PARATYPE : MNHN 1986-600, 30.5 mm standard length, collected with the holotype.

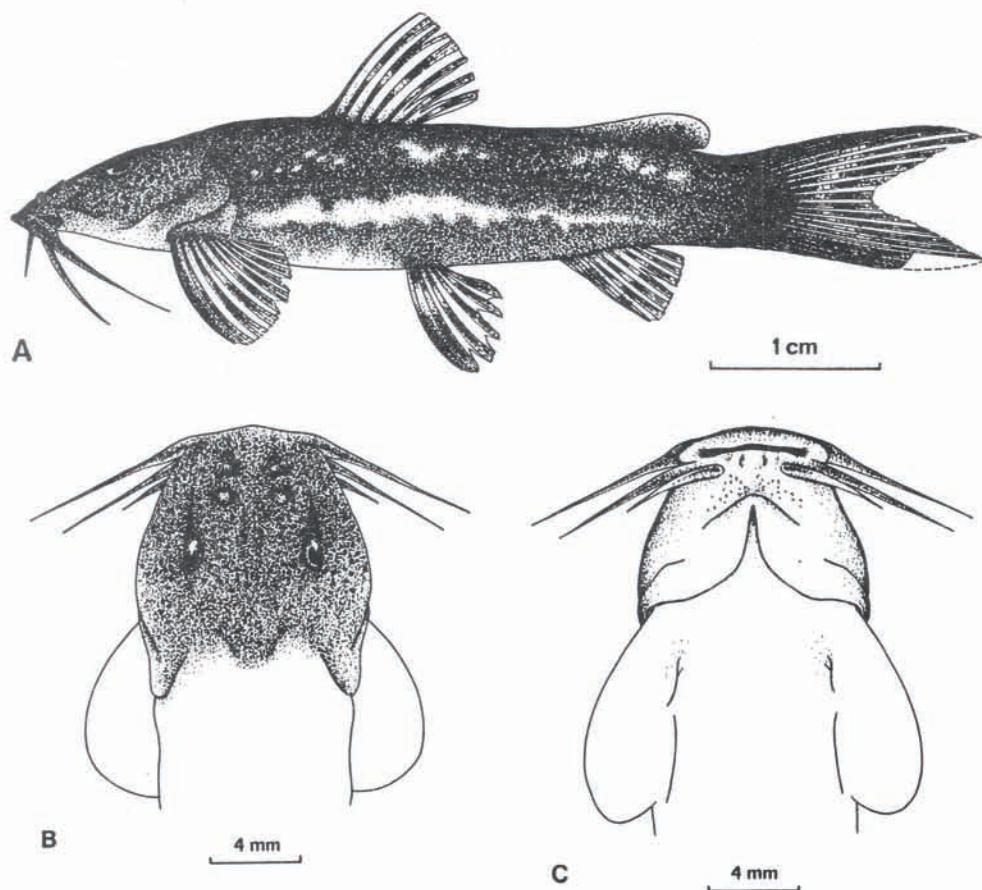


Fig. 1 : (A) Lateral view of *Amphilius kakrimensis*, holotype, 42.4 mm SL ; (B) Dorsal view and (C) Ventral view of the head of the holotype.

DIAGNOSIS :

In having a firm, compact body and strongly forked caudal fin *Amphilius kakrimensis* is most similar to *A. rheophilus*. It differs from this species in several respects particularly in having a stouter deeper body and deeper caudal peduncle. This dif-



ference is best demonstrated in the form of the caudal vertebrae (Figure 2). The neural and haemal spines of *A. kakrimensis* are slender and tall and set at a high angle to the axis of the vertebral column. In *A. rheophilus* these spines are relatively short and depressed to an acute angle with the vertebral column. *A. kakrimensis* has a broader snout, depressed, wider mouth and longer barbels than *A. rheophilus*. The new species differs from *A. platychir* by its stouter (i.e. relatively deeper) more compact body and caudal peduncle, the shape of the caudal fin (shallow fork or emarginate in *A. platychir*) and in several proportions on the head including a deeper more wedge-shaped head and eyes set further apart. *A. kakrimen-*

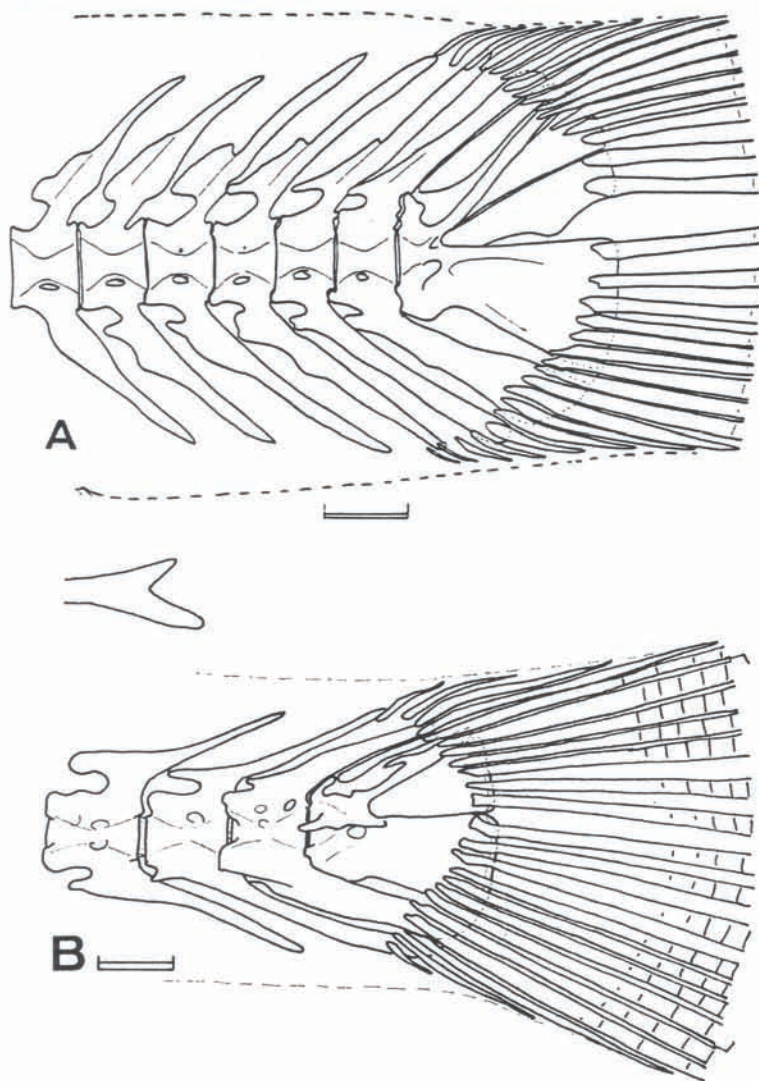


Fig. 2 : Caudal skeleton of (A) *Amphilius kakrimensis*, holotype and (B) *Amphilius rheophilus*, AMG/P 9560, 67 mm SL, from the Kokoulo river at Pita, Guinea ; coll. C. Lévêque. Scale : bar = 1 mm.

Table I : Measurements and meristic counts for the holotype and paratype of *Amphilius kakriensis*.

	Holotype		Paratype	
	mm	%	mm	%
Total length	56.6	—	39.4	—
Standard length	42.4	—	30.5	—
Predorsal length	18.2	42.9 (SL)	13.1	43.0 (SL)
Head length	10.9	25.7 (SL)	8.5	27.9 (SL)
Head depth	5.8	53.2 (HL)	4.7	55.3 (HL)
Head width	9.9	90.8 (HL)	7.5	88.2 (HL)
Snout length	6.0	55.1 (HL)	4.6	54.1 (HL)
Eye diameter	1.0	9.2 (HL)	1.0	11.8 (HL)
Interorbital distance	4.3	39.5 (HL)	3.5	41.2 (HL)
Postorbital length	3.9	35.8 (HL)	3.0	35.3 (HL)
Body depth	8.3	19.6 (SL)	4.9	16.1 (SL)
Body width	9.0	21.2 (SL)	5.9	19.3 (SL)
Caudal peduncle length	8.0	18.9 (SL)	4.9	16.1 (SL)
Caudal peduncle depth	5.5	13.0 (SL)	3.5	11.5 (SL)
Dorsal fin length	9.6	22.6 (SL)	7.2	23.6 (SL)
Anal fin length	7.4	17.5 (SL)	6.0	19.7 (SL)
Pectoral fin length	9.2	21.7 (SL)	7.2	23.6 (SL)
Pelvic fin length	8.4	19.8 (SL)	6.6	21.6 (SL)
Adipose fin length	7.5	17.7 (SL)	5.7	18.7 (SL)
Maxil. barbel length	8.8	80.7 (HL)	6.4	75.3 (HL)
Inner mand. barbel length	3.8	34.9 (HL)	3.6	42.4 (HL)
Outer mand. barbel length	6.2	56.9 (HL)	5.0	58.8 (HL)
Distance eye-posterior nares	2.6	23.9 (HL)	1.5	17.6 (HL)
Distance post.-ant. nares	1.4	12.8 (HL)	0.7	8.2 (HL)
Distance ant. nares-mid tip	2.5	22.9 (HL)	2.1	24.7 (HL)
Distance anterior nares	1.9	17.4 (HL)	1.7	20.0 (HL)
Distance posterior nares	1.9	17.4 (HL)	1.7	20.0 (HL)
Distance head-dorsal fin	7.0	16.5 (SL)	5.7	18.7 (SL)
Genital papillum length	0.8	1.9 (SL)	0.6	2.0 (SL)
Distance anus-anal fin	5.4	12.6 (SL)	3.7	12.1 (SL)
Distance pelvic-anus	1.9	4.5 (SL)	1.4	4.6 (SL)
Pelvic-anus/Pelvic-anal	—	26.0	—	24.1
Dorsal fin rays	i + 6		i + 6	
Anal fin rays	iii + 6		iii + 6	
Pectoral fin rays	i + 9		i + 8	
Pelvic fin rays	i + 5		i + 5	
Caudal fin rays	10/6 + 7/10		10/6 + 7/9	
Vertebrae	32		32	
Precaudal vertebrae	14		13	
Caudal vertebrae	18		19	
Predorsal vertebrae	3			
Precanal vertebrae	19		18	
Gill rakers on 1st arch	10		10	



*sis* is distinguished from *A. atesuensis* by a shorter predorsal distance (and fewer predorsal vertebrae), a deeper body and caudal peduncle, its eyes are set further apart and it has a longer snout and shorter barbels than the latter species. In *A. kakrimensis* the dorsal fin is ahead of the pelvics whereas in *A. atesuensis* the dorsal fin is located partly over the pelvics. *A. atesuensis* is also distinguished by having the epaxial muscles inserted postero-dorsally on the neurocranium (in *A. kakrimensis* they insert posteriorly).

#### DESCRIPTION :

Based on the holotype and the paratype. *Amphilius kakrimensis* is a relatively stout, compact species with morphometric proportions and meristic values as given in table I.

The head is wedge shaped in lateral view, forming a 30° angle to the horizontal. From above the head is equally wide as long, the anterior margin of the snout straight or only slightly curved. The dorsal surface of the head is flat and smooth, the ventral surface is flat and microscopically rugose in texture. The eyes are located supero-laterally, approximately midway between the tip of the snout and the posterior margins of the operculae. The eyes are without free borders and are widely separated, by a distance 3.5 to 4.3 times the eye diameter. The anterior and posterior nares are separate but close to each other, the posterior nares are closer to the eyes than to the tip of the snout. The distance between left and right nares is less than 50 % of the interorbital distance. The anterior nares have low tubular rims, capable of closing the opening from behind. The posterior nares have a short flap-like appendage, closing the opening from the front (anterior side).

The mouth is subterminal and straight. The lips are papillate and moderately fleshy. There are three pairs of depressed simple (flagellate) tapered circum-oral barbels. The maxillary barbels have a proximal posterior fold or flap and are broadly attached to the dorso-lateral side of the mouth. They reach beyond the anterior bases of the pectoral fins. The inner mandibular barbels are located bilaterally midway between the midline and the lateral corners of the mouth and do not reach the free edge of the branchiostegal membrane. The outer mandibular barbels originate on the ventral side of the corners of the mouth and reach the anterior bases of the pectoral fins. The branchiostegal membrane is moderately broad and semi-attached in the midline, where it is divided by a deep notch. The membrane extends laterally and dorsally over and behind the anterior base of the pectoral fin to the level of the eyes. The gill rakers on the anterior arch are slender and pointed. In common with other species of *Amphilius* there are no gill rakers on the inner margins of the first and second gill arches.

Anteriorly the body is stout and ovoid in cross section, but flattened ventrally from the pelvics to the head. Posteriorly the body becomes progressively compressed to the caudal peduncle which is somewhat longer than deep ( $0.68 \leq D/L \leq 0.71$ ). A crenellated fold of skin covers the base of the caudal fin on either side. The lateral line runs straight midlaterally from the head to the tip of the median finger of the crenellated fold at the base of the caudal fin. The anus is situated im-

mediately anterior adjacent to a short conical genital papillum, both of which occur behind the bases of the pelvic fins.

The dorsal fin is placed behind the posterior edge of the pectoral fins and its base lies ahead of the anterior base of the pelvic fins. The dorsal fin is short-based and straight-edged with the unbranched leading ray, sub-equal to the full length of the fin. The anal fin is short-based and straight-edged with the anterior unbranched ray sub-equal to the length of the fin. The caudal fin is forked with pointed lobes of which the lower is slightly longer. The outer principal caudal fin rays are broad and well developed and equal the full length of the lobes. The pectoral fins are expanded and obtuse with the anterior 4-5 rays aligned horizontally and the posterior or inner rays aligned vertically adjacent to the body wall. The leading ray is filamented anteriorly and covered by a thickened fleshy pad. The horizontally aligned pelvic fins are curved and semi-rectangular in shape with the outer ray padded and filamented. The branched rays are padded on the ventral side. The adipose fin is relatively short and rounded with a small posterior basal notch. It is located directly above the anal fin.

**COLORATION** : Apart from the off-white ventral side of the head and body, anterior to the pelvic fins, the general colour of the preserved specimens is a dark chocolate brown. The dorsal surface of the head and body to the caudal peduncle is covered with a secondary layer of small discrete dark spots. There is a narrow light horizontal band along the body, starting at the base of the pectoral fin and petering out above the anal fin. The vestiges of a second light horizontal band occur above the lateral line from behind the head to above the pelvic fins. The leading ray of the dorsal fin is dark brown, the branched rays are barred with dark brown and the membrane of the fin is hyaline. The rays of the anal fin are dark brown, the inner rays are barred. Only the upper surface of the paired fins are barred with brown, the membranes being pale brown basally to hyaline distally. The adipose fin is generally dark brown with a secondary layer of spots except for a clear outer marginal band. The eyes are dark brown and the maxillary and outer mandibular barbels are entirely or at least dorsally, deeply pigmented in brown.

**DISTRIBUTION AND HABITAT** (Figure 3) : Kasseri is a small village on the road from Kindia to Telimele, about 10 km towards the latter from the bridge over the Konkoure river. From the village, a small path ( $\pm 1$  km) leads to the Kakrima river, just above its confluence with the Konkoure. After a distance of about 800 m from the village, the path crosses a small tributary of the Kakrima river. At this locality, *Amphilius kakrimensis* was caught. It is surrounded by forest galleries. When collecting the new species, the water level was low and there was almost no current (dry season). The water flows on the rocky bottom.

The new species is at present only known from its type locality. The Kakrima river is formed by the junction of several rivers, all descending from the Labe-Plateau (Central Guinea) via spectacular waterfalls, situated above 500 m altitude (Daget, 1962). After about 150 km, the Kakrima river joins the Konkoure river.



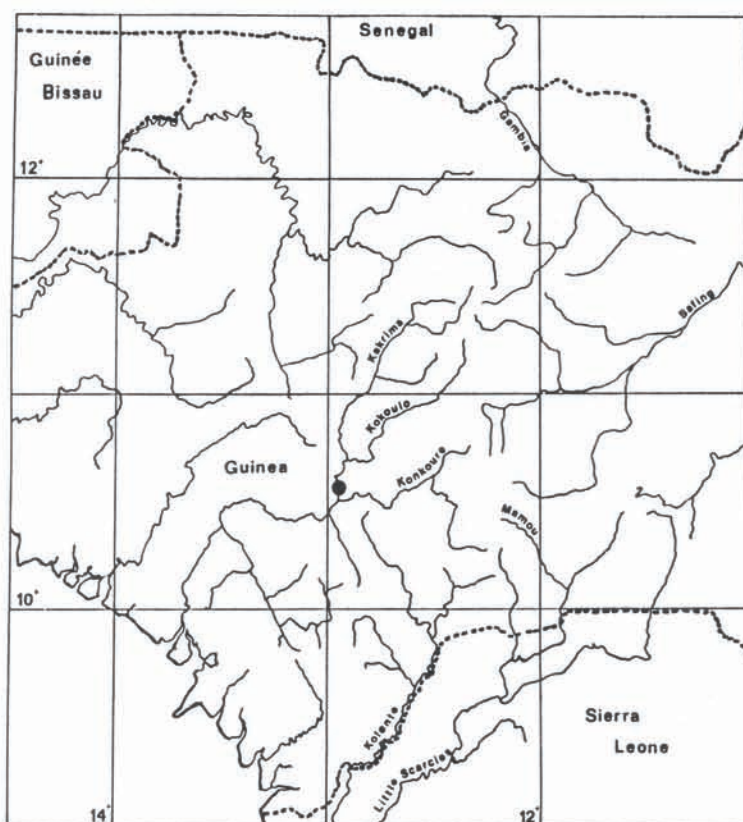


Fig. 3 : Geographical distribution of *Amphilius kakrimensis*.

Together with *Amphilius kakrimensis*, the following species were collected at the type locality : *Mormyrus tapirus* Pappenheim, 1905 (senior synonym of *Mormyrus goheeni* Fowler, 1919) ; *Paramphilius trichomycteroides* Pellegrin, 1917 ; *Clarias salae* Hubrecht, 1881 ; *Heterobranchius isopterus* Bleeker, 1863 ; *Hemichromis fasciatus* Peters, 1857 ; *Tilapia louka* Thys van den Audenaerde, 1969 ; and *Caecomastacembelus liberiensis* (Boulenger, 1898).

The distribution of these species seems restricted, except for *Hemichromis fasciatus*, to what is generally indicated as the Guinean area (Daget, 1962 ; Daget & Ittis, 1965). This area is characterized by a mountainous relief, a rather humid climate and a vegetation resembling to the forest type, especially along the rivers.

**RELATIONSHIPS** : Skelton & Teugels (1986) listed three valid *Amphilius* species from West Africa : *A. platychir* (Günther, 1864). *A. atesuensis* Boulenger, 1904 and *A. rheophilus* Daget, 1959.

All these species are characterized by having 6 + 7 principle caudal fin rays

and the relationships of *Amphilius kakrimensis* lie within that group of West African species. Of these, *A. atesuensis* is excluded from immediate or sister-group relationships by virtue of having certain derived characters of the head and axial skeleton that are not shared with the other species (Skelton, in prep.). Without being able to examine the osteology of the new species in lack of conspecific material, it is difficult to place the relationships as closer to either *A. platychir* or *A. rheophilus*. The overall or general morphology of the head, the stout build and forked caudal fin are more similar to *A. rheophilus* than to *A. platychir*, but these are functionally orientated features that do not necessarily reflect phylogenetic relationships.

**ETYMOLOGY** : *Amphilius kakrimensis* named after the Kakrima river, Guinea.

**DISCUSSION** : Apart from the type locality, two other stations on the Kakrima river have been explored during February 1986 : Balaya and Koussi. At the former station several specimens of *A. platychir* and *A. rheophilus* were caught. *Amphilius platychir* described from Sierra Leone, has already been reported from Guinea under its junior synonym *A. grammatophorus* Pellegrin, 1913 (see Skelton, 1984). The species was found in the Kokoulo river (Konkoure basin), in the Bafing river (Senegal basin) and in some tributaries of the Mamou river (Little Scarcies basin). *Amphilius rheophilus* was described from the Upper Gambia river but has also been reported from the Konkoure basin, from the Bafing river (Senegal basin) and from tributaries of the Mamou (Little Scarcies basin) (Daget, 1962).

As with most of the *Amphilius* species presently known, these species thus have a fairly wide distribution and they are not confined to restricted river basins. Exceptions are recently described species from the Luongo river in Zambia (Skelton, 1986) and a species from the Revue/Buzi river system (Skelton, 1984). *Amphilius kakrimensis* most likely is also restricted in distribution and it is expected that further similarly restricted species remain to be discovered because the taxonomy of the Amphiliidae has not been clearly focussed on in the past.

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#### REFERENCES

- DAGET, J., 1962.— Les poissons du Fouta Dialon et de la Basse Guinée. *Mém. Inst. Fr. Afr. noire*, 65 : 210 pp.



- DAGET, J. & ILLIS, A., 1965.— Poissons de Côte d'Ivoire (eaux douces et saumâtres). *Mém. Inst. Fr. Afr. noire*, 74 : 385 pp.
- ROBERTS, T., 1975.— Geographical distribution of African freshwater fishes. *Zool. J. Linn. Soc.*, 57 (4) : 249-319.
- SKELTON, P.H., 1981.— The description and osteology of a new species of *Gephyroglanis* (Siluriformes, Bagridae) from the Olifants River, South West Cape, South Africa. *Ann. Cape Prov. Mus., (Nat. Hist.)*, 13 : 217-250.
- 1984.— A systematic revision of species of the catfish genus *Amphilius* (Siluroidei, Amphiliidae) from east and southern Africa. *Ann. Cape Prov. Mus., (Nat. Hist.)*, 16 : 41-71.
  - 1986.— Two new *Amphilius* (Pisces, Siluroidei, Amphiliidae) from the Zaire River System, Africa. *Rev. Zool. afr.*, 99 (3) : 263-291.
  - in prep.— Intrafamilial relationships and classification of African Amphiliid catfishes.
- SKELTON, P.H. & TEUGELS, G.G., 1986.— Amphiliidae. In : Check-List of the Freshwater Fishes of Africa (CLOFFA). Ed. DAGET, J. GOSSE, J.P. & THYS VAN DEN AU-DENAERDE, D.F.E., ISNB, MRAC, ORSTOM, Vol. 2 : 54-65.
- TAYLOR, W.R. & VAN DYCK, G.C., 1985.— Revised procedures for staining and clearing small fishes and other vertebrates for bone and cartilage study. *Cybium*, 9 (2) : 107-119.

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